Work Sharing: Can Reduced Working Hours Potentially Increase Employment? The Case of Recessions in the U.S.

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Work Sharing as an Institutionalized Practice to Preserve or Create Employment: Overview

Work Sharing, generally, is considered to be any type of policy-induced, downward adjustment of working time. Work Sharing falls into two types. One is when it is designed to induce a permanent reduction in the length of work hours among all, or large subsets, of workers, in the form of shorter weekly or annual hours. These may take the form of shortened standard or legal workweeks (after which is considered “overtime”), hard limits on the duration of workers’ annual, weekly or daily overtime work hours, or annual leave times or various forms of paid time off. The second type of “work sharing” is designed to induce reductions in work hours that may be temporary, including those triggered by economic crises, such as government programmes designed for the purpose of preventing or postponing planned layoffs by employers, to preserve employment or curb increases in unemployment. It is usually adopted or if already in place, promoted during a cyclical downturn, such as the recent global financial crisis and subsequent worldwide recession. The goal of work sharing is typically to add to the employment level. In the case of temporary work-sharing, the aim is to promote downward adjustments of work hours to cushion the impact of a recession on as many number of workers as possible, while also promoting job and employer attachments that will benefit employers in the longer run by saving them often burdensome training and hiring expenses when a downturn eventually ends. The main goal of permanent work sharing is to foster more hiring instead of lengthening work hours. Both types of work-sharing are intended to curb the rate of unemployment, the first by reducing unemployment rates in the longer term, and the second by preventing or postponing layoffs that would likely lead to higher unemployment in the short term. Both, however, may act to reduce the incidence and/or duration of unemployment, by counteracting not just cyclical but the structural forces that may restrain job creation or encourage job destruction. Thus, even a crisis-driven work sharing system, if institutionalized, could become one of the built-in, automatic stabilizers for the macroeconomy, as a more proactive tool for the next recession. Its effectiveness may be facilitated if and when it is supported concurrently by other economic incentives for employers to shorten duration of work hours, hold on to, retrain or hire workers. Moreover, both types of work sharing may also provide more job opportunities in recovery or expansionary periods. Often overlooked is that it may not only spread work but spread well-being more generally, to extent that the layoffs would have been concentrated on certain worker sub-groups who tend to suffer most in terms of income loss and re-employment fortunes (particularly if subsidized by partial wage replacement compensation), and also if the hours that are reduced would have otherwise led to symptoms of overwork, such as adverse mental and physical health effects of longer work hours. Support for the well-being effects of work sharing is derived from a theoretical foundation that it would counteract some of the longer-term forces that have created an increasingly inherent bias toward layoffs rather than hours reduction during recessions, and lengthening work hours during expansionary periods. Thus, work sharing may have broader goals, of which maximizing available job opportunities is an important subset. It includes the goal of creating more non-work time for more workers, greater potential well-being on the job for those employed, such as reduced job insecurity, reduced work stress and fatigue and greater work-life balance. Such benefits are generally the flip side of the costs to workers of working very long hours.

The Theoretical Case for Facilitating Work-Sharing: Welfare, Efficiency, Equity Effects

The outcomes of any market or policy can be evaluated using five criteria—the effects on individual and social or welfare, productive efficiency, dynamic efficiency (economic growth) and social equity. In pure economic theory, market forces are presumed to adjust so that no one can be made better off without making someone else equally worse off, i.e., ideally, no losers at all. But in practice, real world impediments such as limited information, negative externalities and relative immobility of labor and its relatively lower bargaining power vis-à-vis employers, etc., may make it possible to improve societal well-being, on balance, with a carefully designed labor market policy intervention, such as short-time compensation (STC). Both temporary and permanent work sharing measures, however, have historically been promoted mainly in the interest of overall social welfare and equity, while not impinging on growth. By spreading the distribution of the impact of recessions more thinly, but more widely, a fewer number would be unemployed although at the risk of more workers being temporarily underemployed. The economist’s criteria may judge a policy-induced re-allocation of hours as desirable as long as the winners who benefit from the change gain more than the losers lose, on balance.
Workers with reduced hours, for example, to part-time status, even if voluntary, may not experience improved welfare if it leads to reduced income and/or inferior working conditions (Gash, Mertens and Gordo, 2012). Thus, the provision of partial compensation such as STC is crucial toward improving social and perhaps even individual welfare. The individual welfare case derives not only from the potential cushioning of income loss for individuals or reduced risk of being laid off, but in its provision of nonmonetary benefits such as time off, a more flexible employment relationship, and potentially lower stress and fatigue caused by longer hours of work. Work-sharing is also a system that promotes a sort of “risk-sharing” pooling the risk of the probability of unemployment. The social welfare case for a re-allocation of work time generated by work sharing policies would be in the best case, “Pareto-improving” making at least one individual better off without making any other individual worse off. In the more realistic case, a net social welfare gain occurs if the marginal reductions in welfare among those who do not get the extra work hours they prefer, are exceeded by the size of the gains in welfare experienced by those who would others been rendered unemployed or more underemployed. This net social welfare gain is particularly likely had some workers been working more hours than they might have preferred, i.e., were overemployed or working involuntary but required overtime hours—earning incomes they might have been prepared to sacrifice to attain shorter hours, but not given the choice to do so. The net social welfare outcome largely depends on the extent to which actual hours and changes in them align with (initial or eventual) preferences (Lee, McCann and Messenger, 2007). With work-sharing policies, some workers may have a perceived aversion to loss of income, which may be greater than their aversion to the loss of time. If their perceived probability of being laid off is low, well-being may be lowered. But this can be altered with the use of STC. Indeed, the theoretical economic cases for regulatory limits on work time generally are to prevent increases in: 1) unemployment and overemployment mismatches that have proven, unfortunately, not to resolve themselves [e.g., Otterbach, 2009; Davoine and Média, 2009; Henneberger and Sousa-Posa, 2002; Golden and Gebreselassie, 2007], and the crowding out of other uses of time that have a beneficial purpose for future human and social capital development—parenting, civic activity, student time, etc. [e.g., Public Agenda, 2009]. The latter also supports the long-term growth case for either work sharing. The efficiency case for adopting more work sharing is that it would utilize more available labor resources, to the extent that it minimizes layoffs that lead workers to experience extended spells of unemployment. This is pertinent particularly in the US case, where as high as 42 percent of the unemployed have been unemployed for over half a year (BLS, 2012). In addition, work sharing may actually contribute to efficiency to the extent that shortened hours help firms minimize their unit labor costs in the longer run by their savings on hiring and training. Similarly, to the extent it shortens the duration and depth of an economic contraction, it contributes to the longer term rate of economic growth. Thus, there is both a macroeconomic and microeconomic efficiency cases for work sharing policies.

Employment Effects of Work Sharing: Restraints, Offsets and Leakages Limiting Employment Creation

What would be the realistic expectations of the employment creating effects of a work sharing policy? Most analyses of the potential employment-creating effects of any type of work hours reduction, especially permanent but also temporary, start from a theoretical labor demand perspective. That is, they begin with a model that presumes that at any given rate of wage (W) cost, employers will choose an optimal bundle of employees (E) and work hours (H). In the “ideal” work sharing policy model, the response of employment would be a one for one substitution following a reduction in hours per worker (Freeman, 1998). That is, reducing hours by 10% would open up 10% more job vacancies. For example, shortening the workweek from 40 to 36 hours at a firm with 50 employees would create 5 new jobs at the firm. This, however, is only likely to be the best case scenario. It is realistic to assume, however, that a fully proportional response is prevented by many constraints and complications. This is particularly likely in the short run span of time for some effects, and in the long run span of times for others. Thus, the predicted employment effects will depend on the scope of time, microeconomic versus macroeconomic framing, and temporary versus permanent type of hours reduction.

Indivisibilities of Labor

One possible constraint on employment creation with work-sharing is that workers are sometimes not perfect substitutes for each other. Thus, hours of one worker may not be fully transformed into jobs or more work hours for another worker (Freeman, 1990). This represents is the so-called, “indivisibility” of labor issue. However, this
may only have merit for, skilled labor positions and knowledge workers, particularly in the short run period of time, and within the same firm. In industries where workers may be somewhat interchangeable and jobs or tasks often routine, such as in manufacturing, the indivisibility of labor concern may be overstated. Indeed, in their quest to dismiss potential positive employment effects, however, work sharing opponents often have taken this potential critique beyond the point of credibility, by claiming a belief on the part of work sharing advocates in a “lump of labor fallacy.” The latter refers to the notion that at any one point in time, there is a fixed amount of work to be done in an economy, such that any increase in the amount each worker can produce would reduce the number of available jobs. Historically, this argument has been invoked to refute the truly erroneous fear that automation leads to mass unemployment. Indeed, if these structural changes are accompanied by sustained aggregate demand, there would be a displacement of jobs opportunities, but not necessarily unemployment. Thus, similarly, as long as aggregate demand is healthy enough to sustain the overall demand for output, it is not wholly fallacious to predict that either more jobs or more hours in sectors elsewhere in the economy might appear, following an induced reduction in workweek lengths, even if there is no such thing as a “fixed amount of labor to be done.” The critics’ argument can be countered by any evidence that demonstrates that overall output does not outright fall following an induced decline in hours.

Thus, what is the theoretical step by step sequence of how policy-induced reductions in hours may, or may not, be translated into gains in employment, typically referred to as the “employment effects” and their potential “offsets”? Both microeconomic and macroeconomic perspectives offer some possible complications in the transformation of hours reductions for some into employment opportunities for others. Many possible filters exist between converting a reduction in hours into eventual employment creation effects. Many of them will mitigate the extent to which employment responds to a given reduction in hours. These “indirect effects” most often work against job creation rather than toward it, but sometimes only in the longer run. In recessionary times, preventing the rate of layoffs and unemployment in the short run may take precedence. In brief, the net effect on employment levels ultimately depend on the extent to which employers instead choose to use more overtime hours above a new, lower standard workweek; the extent to which weekly wages fall in proportion to the hours reduction and the relative importance of fixed costs of labor which cannot be reduced when hours are decreased; the extent to which labor productivity per hour changes, perhaps due to reduced fatigue, down time and labor hoarding or a greater work pace and work effort; and the lags in the adjustment process of hours and employment changes over time. We will explore first the direct effect, on output, and then each indirect effect separately. While there is a cost to following any policy, there is also a cost to not adopting a policy. This includes the cost of not having work sharing (lower case) in place at the advent of a recession. In addition, policies that promote reductions in hours create a potential range of lasting benefits, even beyond the potential job creation or layoff prevention, many of which may accrue in the longer run and are not apparent in the short run. Briefly, it could improve overall worker welfare, particularly if it is well targeted to the sectors where hours of work tend to be longer than is healthy or preferred by employees.

Output Effects

There are direct effects when hours are reduced because of a public policy of work sharing, intended to permanently reduce the standard work hours across all sectors. Either employers have to reduce output proportionately, or create more jobs to recoup the potential drop in output. While few believe that the increase will be proportional, some maintain the fraction will be significantly greater than zero while others hold that the fraction may be closer to zero and perhaps even negative. Theoretically speaking, the simple arithmetic of reducing hours can be represented as,

\[ \Delta H \rightarrow \frac{\Delta Q}{\Delta H - \Delta E} \]

If standard hours (H-bar) are reduced, via institutional (e.g., legislative) processes, this triggers both a direct and indirect effect on employment (E). First, it produces a direct effect on actual hours worked (H). To produce the same level of output (Q) as previously, a direct effect of reduced hours would be to increase employment. However, a positive employment effect occurs only to the extent that hours and employment are potentially substitutable in the total amount of labor input in a production process. If there is indivisibility of labor, it makes it difficult to replace the lost output with the hiring of a new employee, leaving output lower. Output also drops if there are
some complementarities between employees and hours in an organization’s or production process’s use of labor input, e.g., fewer support staff positions might be needed if factory, office or store hours per week are shortened.

The ultimate effect on employment turns on whether a macroeconomic view, rather than a strictly microeconomic one, is adopted. The microeconomic perspective is particularly useful in analyzing the effect on employment under contrasting assumptions. For example, suppose there are diminishing marginal returns in employment but constant returns to hours. That is, hiring additional employees contributes ever smaller increases to a firm’s overall output. If hours are reduced by, say, 10 percent, then the corresponding increase in employment needed to keep constant the firm’s level of output needed would be greater than 10 percent. Thus, under such conditions, the employment effect would likely be positive, all else equal. The macroeconomic view emphasizes the crucial role of aggregate demand. The Keynesian perspective assumes that total spending throughout the economy would not be altered with work-sharing, as long as the total amount of disposal income does not decrease, although the composition of output produced might be altered. Thus, employment opportunities might shift across sectors, depending on the type of consumption spending that increased or decreased after work sharing, but employment would not decline in total. Indeed, in the case of work sharing, preventing layoffs and consequent unemployment might curb the spiraling downward of aggregate demand, even if underemployment might be more widespread. 

Real Labor Cost per Hour

The employment created by a reduction in hours is largely contingent upon the extent to which hourly wage rates effectively rise. There is little chance work-sharing can expand employment much if employees’ weekly earnings remain the same after the decrease in their hours (with the exception of a prior or consequent rise in labor’s productivity). Unit labor cost (ULC) per hour is likely to rise, if weekly pay is not reduced proportionately, unless the work-sharing program includes some kind of wage subsidy to offset a rise in labor cost. Otherwise, shortening hours raises the employer’s per hour labor cost and perhaps increases the prices of their good or service. This rise in hourly cost may reduce demand for a firm’s output (the adverse “scale effect”) and thus cut their overall quantity of labor demanded. It might also in the longer run encourage firms to replace labor with capital in their production process (the “substitution effect”). In addition, if work-sharing results in effectively higher real wage rates per hour, there is a potential labor supply response in the longer run. Higher real wage rates might ultimately induce greater labor force participation. This is not a bad thing; however, in a recessionary time this might actually boost up the aggregate (industry or national) unemployment rate, particularly if many of those workers whose hours are lowered take secondary jobs outside their firm that might otherwise have gone to an unemployed job seeker. 

The Role of Fixed Labor Costs and Underutilized Capital Capacity

A further complicating factor in predicting employment effects is that there are often substantial fixed costs of hiring additional labor. These include three types of fixed costs associated with adding employees—the costs of recruiting and hiring, the cost of training, and expenses that are fixed per employee but do not vary with hours such as insurance and paid leave times. The presence of any fixed costs associated with adjusting the employment level may result in a labor market that creates longer hours and fewer short-hours jobs than a labor force might prefer (Rebitzer and Taylor, 1995). The presence and growth of such costs incentivizes employers to extend hours of work per employee rather than expand new hiring during expansion times. Moreover, and more pertinently, it incentivizes employers to use layoffs rather than hours reductions, during downturns. Anything that raises the ratio of fixed costs of labor thus would lead to less “labor hoarding” (holding on to employees longer than needed) and more “hours hoarding” (i.e., longer hours than the minimal needed) rather than job creation (Glosser and Golden, 2004). There is a legitimate concern that firms’ capital capacity becomes more underutilized when work-
sharing shortens typical shift lengths. A rise in ULC will be reinforced all the more if decreased hours per worker result in reduced rates of capital capacity utilization.

Overtime Leakage

If a reduction in the workweek standard length inhibits firms' output, then employers may choose to schedule some employees' hours longer than the new standard hours, e.g., lengthen the extent of overtime hours. This inhibits the potential amount of new job creation is thus is referred to as the "overtime leakage" (Rubin and Richardson, 1997). A rise in unit labor costs (ULC) following the shorter standard (either because of an effectively higher hourly wage rate and/or higher ratio of fixed to variable labor costs) is all the more likely when there are premium wages paid for the additional overtime work performed. Thus, employers may find it rational to keep work hours nearly as long as they were before the reduced standard. This, actual hours would not be reduced commensurately with announced standard. The theoretical prediction is that in firms already using no overtime hours, there will be net positive employment effects but in firms using overtime hours "in equilibrium" there may well be net negative employment effects (Hart, 1987; Andrews and Simmons, 2001). The "meta-estimate" average elasticity is 0.80, or slightly less than unity (Hart and Wilson, 1988; Owen, 1989; Andrews and Simmons, 2001). This means that a 5 hour reduction in the standard workweek length would reduce employers' average hours scheduled by 4 hours (the actual range, based on several countries manufacturing sectors through the 1980s was from 0.67 to 1.21. Thus, a consensus estimate of the "overtime leakage" is estimated at about 20 percent, and perhaps as low as 0.10 of the initial reduction in hours when looking at the national and not just aggregate industry level (Bosch and Lehn, 2001). Firms facing shortages of skilled labor will raise the level of overtime hours to keep output from falling. This in turn may raise hourly wage costs, heightening ULC and suppressing subsequent gains in employment. However, an overtime leakage effect tends to be higher in the short run but dissipates in the longer run, when management can implement changes in work organization that preclude the need for overtime.

Skill Shortages and Mismatches

The most stubborn limit, especially on achieving the ultimate goal of shrinking unemployment, is the extent to which there is a mismatch or difference in the skills between the unemployed and the employed. In some cases, reducing the hours of the employed does not necessarily induce hiring of those who are unemployed (Freeman, 1998). One potentially serious obstacle to job creation following a reduction in hours is present if there are already skill shortages in the occupation or industry where hours are reduced. Even if employers increase the number of positions, they may not be able to fill the vacancies (Freeman, 1998). This divisibility of jobs problem can be serious [White, 1986]. Some economists predict that imposing shorter working hours under the assumption of indivisibility of work hours would lead to more general skill shortages and consequently, undesired increases in (costly) overtime hours because of the inability to fill job vacancies. This suggests that work time redistribution will not be able to resolve unemployment or underemployment between skill groups, only within skill groups. Reducing hours can conceivably even backfire to the extent skilled and unskilled jobs are complementary and physical and human capital gets used less (Freeman, 1998). Unskilled, skilled and high-skilled workers have different labor demand elasticities with respect to real wage rates. If most of the unemployed are unskilled, and skilled and unskilled labor are complements, then a reduction in work time of skilled labour may even decrease the demand for the unskilled unemployed (Freeman, 1998; Bauer and Zimmermann, 1999).

Productivity offset

Working time reduction in the form of a shorter standard workweek is likely to reduce productivity per worker. Shorter hours is clearly likely to reduce output (Q) levels. However, one of the sources of confusion in the debate over the eventual employment effects of hours reduction is that there are two, separate definitions of "productivity." Not only is there productivity per worker, but there is also the productivity per hour of work. Even while total output is reduced, work-sharing also may yield an increase in average productivity per hour. Most likely, the decline in output may be less than proportionate to the decline in actual hours. This is the case if the last hour of work, on the margin, was less productive than the average hour of work. If the average productivity of labor rises as hours are reduced, average productivity per hour (Q/H) may increase to keep output (Q) constant.
The “productivity offset” precludes the need for employers to add employees, at least less than a number proportionate to the hours decline. The productivity offset may develop if worker fatigue is reduced, the pace of work per hour is intensified, or “hoarding” of labor is reduced [Whitely and Wilson, 1986; Owen, 1989]. For example, if hours are reduced by 10 percent but output drops by only 5 percent, the productivity offset amounts to 50 percent. Employers will thus be able to recoup the lost output while adding only proportionately half the drop in output. Following an hours reduction, management has a window of opportunity to reorganize work and production so as to improve productivity (White, 1986). In addition, firms may respond to a reduced standard workweek by re-arranging (rationalizing) work hours. This may occur across the day, week or even, perhaps, across the year (“annualization”) in ways that promote higher productivity per hour. Thus, workweek reductions may generate “shock effects” on productivity. If firms lose a proportionately smaller amount of output by shortening standard working times, they need not hire as many new employees to make up lost output.

The productivity effect of reducing hours may not be symmetric at every level of hours. The size of the productivity “offset” tends to be positively correlated with the level of average hours. That is, if hours of work are already lengthy, a reduction in hours policy may engender a large productivity offset. However, the productivity offset may be much smaller when average hours are already in the range of 35 to 40 hours. That is, a 10 percent reduction from 60 to 54 hours may yield productivity per hour gains in excess of 50 percent, but the same 10 percent reduction from 35 to 31.5 hours per week might yield only a tiny gain in productivity per hour. The net effect on job creation may turn on the existing extent of unproductive time in the course of the working day. Reducing the workweek will generally increase the employment level but this policy may serve to aggravate the employment situation if daily productivity was already very high and the resulting productivity offset is low, insufficient to cover the costs of employment adjustment (Domingueza, Ulíbarria and Zabaletaa, 2011).

The estimated size of the productivity offset varies between 10 and 50 percent (Bosch and Lehndorff, 2001; Roche, Fynes and Morrissey, 1996). While the gain in productivity may obviate the need to hire more labor, undermining the goal of an immediate gain in employment, this does have a longer term advantage. Thus, from the micro level perspective, greater productivity of labor per hour induced by hours reduction surely restrains subsequent growth in jobs (Owen, 1989). However, when expanding the scope to the aggregate (industry or macroeconomic) level, labor demand theory suggests higher productivity increases the relative value of an hour of labor input vis-à-vis other resources. If hours reduction leads to higher per hour productivity, labor eventually becomes relatively more attractive. For example, labor becoming a more productive resource might lead firms to add a job as opposed to making an investment in a financial instrument. In the long run, the benefit of productivity gain per hour can show up also in the form of greater labor retention, as well as market competitiveness [White, 1986]. Firms’ products and services become more price-competitive domestically and abroad, enhancing rather than stifling job creation effects. Thus, higher labor productivity per hour may stimulate more job creation in the aggregate over the longer run even while suppressing employment at any particular firm in the short run (Owen, 1989). (This abstracts from the bi-directional causality issue that productivity gains sustained over time may lead to reduced hours via the “net income effect” on labor supply, e.g., workers’ preference for shorter hours (see Richardson and Rubin, 1997).

Offsetting the Offsets? Conditions under Which Employment Would Expand

In sum, the size of the subsequent employment effects of reduced work hours may be suppressed indirectly by any subsequent increase in average overtime hours used, a drop in output supplied or demanded due to higher unit labor costs for employers per hour, the extent of fixed relative to variable labor costs, the rise in average labor productivity per hour, reduced rate of capital capacity utilization, a greater extent to which technologies used in production allow work to be divisible among jobs and hours, and the adequacy of qualified labor available for new positions created. The overall net effect on employment depends on the extent to which the potential direct effect of increasing employment is offset by potential indirect effects that obviate a need for new hiring. If work sharing leads inevitably to higher nonwage labor costs, upward pressure on wages, (ironically by reducing the extent of unemployment), and even reduces the pressure on government to pursue alternative solutions to unemployment (Snower, 1995), then the prospects are bleak for it as an employment enhancing policy tool.
However, the conventional microeconomics-based critique of hours reduction may well be overstated. For example, shortened shifts conceivably can be accompanied by adding more shifts. Indeed, firms that add a new shift may actually boost employment if they seek new employees, provided that aggregate demand is sufficient to purchase or order the output being produced by the shorter but greater number of work shifts. In addition, the pessimistic view may assume too much immobility between skill levels and occupations. Mobility or upgrading may occur in actuality at the workplace level, particularly during periods of macroeconomic upswing. For example, it can occur if employers can change the job content, e.g., eliminate clerical tasks from professional jobs (perhaps reversing direction from what has been occurring up until now because of computerization). Moreover, the potential problem of an inadequate supply of skilled labor and a resort to more overtime hours is likely to occur only in countries known to be experiencing skill shortages rather than countries with extensive systems of vocational training (Bosch and Lehnoff, 2001). All the assumed adjustments are subject to lags, making it difficult to predict and disentangle short, medium and long run effects (Owen, 1989). For example, productivity offsets may exist only in short run and evaporate over the longer term. Projections of the potential employment effects span the spectrum, from the clearly positive (Jacobson and Ohlsson, 2000; Lanoie, Bouiet and Raymond, 2000) to perhaps even a negative employment impact (Kapteyn, Kalwij and Zaidi, 2004). Employment effects might be positive with small reductions in working time while larger reductions may reduce employment (Marimon and Zilibotti, 2000). In addition, examining micro-level cases suffers from a potential bias that would understate how many viable jobs short-time work schemes can save. For example, studying only firms that apply for STC type funds is subject to a selection bias—participating firms tend to be either less competitive than other firms or performing more poorly (Calavrezo et al., 2009). Thus, such firms are less likely to have avoided layoffs or to have created employment without the program.

With the existence of so many alternative scenarios, work-sharing advocates must show how reductions can potentially lead to reduced unemployment, rather than just engage in counter-critiques of the claims of opponents work hour reduction (White, 1986). The wider lens suggests that the employment effects might be positive if the initial level of hours is already low, the reduced hours are accompanied by restrained per hour wages and/or reinforcing government subsidies for hiring, such as reduced payroll taxes [Bosch, Dawkins and Michon (1994)], gains in productivity make labor a relatively more attractive resource to retain or hire, or firms become more competitive in international trade (Cette and Taddei, 1993), new work shifts are added, the unemployed are trained in the skills needed to get hired by firms whose hours per worker have been shortened, and the ratio of fixed to variable labor costs are reduced, e.g., by prorating the costs of employee benefits. Depending on how hours reductions are implemented, it is quite possible to do so without driving up unit costs, increasing overtime work, restraining capital capacity, leaving skilled job vacancies and hindering output growth. Perhaps most importantly, a significant (perhaps near proportional) reduction in wages would enhance the employment effects (van Ginneken, 1984). To generate more jobs, the use of overtime could be discouraged by changing the underlying economics of the hours decision, e.g., reducing the ratio of fixed to variable costs of labor. This could be accomplished by transforming into variable any costs that are currently fixed per employee. Prorating holiday and vacation time and employer contributions to insurance and to payroll taxes, based on hours of work rather than employees, would counter much of the bias toward layoffs and longer hours incentivized by fixed labor costs. What will be needed is a range of policies adopted to “offset the offsets.” This includes reducing the fixed costs of employment (disincentives to hiring); encouraging the reorganization of worktime along with increased capital capacity utilization, and reducing the long run adverse output effects, e.g., encouraging productive leisure and inducing new labor force participation.

**Estimated Employment Effects: Evidence from Anglophone Countries and Others**

There is no single, definitive estimate of the number of jobs created or saved with work sharing. However, there is a broad set of estimates from case studies, industry studies and macroeconomic simulations. Much empirical analysis has developed since the first generation literature considered the potential employment effects, from the micro to the macro level (e.g., Conference Board in Europe, 1981; Ehrenberg and Schumann, 1982; Nemirov, 1984; Cuviiller, 1984; Williams, 1984; Dreze, 1986; Zachmann, 1986; Hill, 1987; Booth and Schiantarelli, 1987; Nyland, 1989; Taddei, 1991; Niefer-Dichmann, 1991; Fromont, 1993; International Labor Review, 1993; Bosch, 1994; International Labor Review, 1995; Roche, Fynes and Morrissey, 1996; Blyton and Trinczek, 1997; EIRR, 1997).
Different estimates of the employment effect of working time reduction may be caused by different conditions in the implementation of working time reduction, by diverse methodological approaches and theoretical views (Bosch, Dawkins and Michon, 1994). There are simply too many idiosyncrasies involved to reduce to a single number the size of the employment effect of a given reduction in hours. First, the hours reduction can take on a variety of forms—temporary or permanent, general or targeted by industry, occupation, age-group or across-the-board, or, via shorter standard weekly hours, limitations on overtime hours and encouraging part-time jobs and earlier retirement or leaves of absence. It also matters whether the measures are voluntary or compulsory, statutory or monetary incentive-based, aimed at weekly, annual or lifetime hours, etc. Such measures may or may not include government subsidized work sharing schemes during cyclical downturns, targeted public subsidies for hiring or training and unemployment insurance (Messenger and Rodriguez, 2010). The ultimate employment effect may depend in part on whether an hours reduction is pushed by the state, workers or employers and the degree to which it voluntarily accepted on the part of workers and complied with (or resisted) on the part of employers.

Second, the employment effects may differ depending on the magnitude, location (country), timing (year or business cycle stage) and the pace of the hours reduction. It also may vary according to occupation (white or blue collar) and industry (goods or services production) and the concurrent changes or matches in labor supply and demand in the occupations or industries experiencing hours reduction. Each enterprise, industry and country may have experienced or introduced working time reduction along with varying degrees of work reorganization, hours flexibilization, extended operating hours or capital capacity utilization, wage rate increase or restraint, public sector subsidization, etc. Third, a particular measure adopted might anticipate the potential offsets and explicitly attempt to prevent them as part of the hours reduction scheme. For example, firms and unions have negotiated an increased planned utilization rate. Fourth, the actual effects of work sharing on employment are difficult to ascertain empirically also because some of the effect occurs through job retention rather than job creation (Blyton and Trinczek, 1997). Indeed, job maintenance may be the predominant and most valuable contribution of work sharing. It is rational from an economic theoretical point of view that temporary work sharing measures that promote job preservation should be stronger than the job creation effects of reduced standard hours. In the latter, firms must incur the costs of recruitment, hiring and training whereas in the former firms do not incur these costs (Bosch and Lehndorff, 2001).

Fifth, estimation procedures each employ a particular model whose scope may or may not be broad enough to capture all the possible offsetting and indirect effects of hours reduction on employment in either the short-, medium- or long-run. The time frame matters for all the offsets and eventual employment effects to work themselves out (Owen, 1989). The effects of hours reduction on employment in the short-term—over a single phase of the business cycle, v.s. the long-term—the period over which the size of the capital stock and even the educational system can be varied, over the several years it would take for the full effects to materialize. The medium term is a period longer than one business cycle, for changes in the (physical and human) capital stock to begin adjusting to a change in working hours, but not yet be fully adjusted. Thus, for example, even when there are measurable effects on overtime hours, they may tend to dissipate over the longer run, when the next cyclical downturn arrives. Thus the job-saving effect of hours reduction may be delayed and not be felt until a future recession (Bosch and Lehndorff, 2001). Finally, deriving an estimate of the employment effect of a working time reduction involves disentangling the effect of working time, economic growth and productivity. Each of these will offset or reinforce the direct employment effect of whatever form of hours reduction is pursued. While most empirical studies presume that the analysis starts from a “shock” to working time that leads to productivity and employment, we know that productivity growth in the long run may lead back to hours reduction. Thus, not only are these variables simultaneous but they are mutually causal or endogenous. Virtually all empirical studies of actual European cases show some positive employment effects. Nevertheless, they also find increases in overtime and labor costs that prove to be restraining factors that inhibit the employment creation effects (Bosch and Lehndorff, 2001).

Samuel Gompers, founding leader of the American Federation of Labor in the 1880s once famously declared, “if one worker is unemployed then hours of work are too long.” While the 8-hour standard working day and 40-hour standard working week were established in the 1930s, working hours have not declined markedly in the US since that time as compared to most EU countries [Bluestone and Rose, 2001]. Despite this, United States’ policy makers...
have not seriously considered policies of working time reduction, in stark contrast to most continental European countries, with the exception of periodic, limited discussion of work sharing programs during recessions. Perhaps this in large part explains the paucity of empirical and case studies in the US regarding the employment effects of working time. Almost all studies of the effects of mandated work-sharing and work sharing programs are of countries that have implemented such laws in Europe or European industries that have collectively bargained such hours reductions. Some include a pooled sample of OECD countries, which may or not include North America. While empirical evidence in North America is scarce, findings from similarly structured Anglophone countries might be instructive. Freeman’s (1998) survey of studies of UK time series found that for every 1.0% (unit) decline in hours, induced by market forces, employment responded upward by 0.1 to 0.7%. In most EU countries, the employment effects of shortening work hours are on the relatively small side. This is likely because workweek and workyear reductions have been all but already exhausted. The potential for employment effects may be higher in countries such as the US, where full-time workweeks are longest. However, the presence of strong employment protection laws in the EU limits employers’ recourse to layoffs (Gray, 1998). This also might serve to limit the amount of employment that can be created with work sharing programs. Some estimates of the relationship between hours and employment in the US found that (relative to Germany), US employment adjusts considerably more than average hours to a given reduction in output demand (Abraham and Houseman, 1995). Similarly, in contrast to other OECD countries, most of the adjustment of labor input to a negative “shock” to output occurs through employment rather than working time in the US (van Audenrode, 1994). However, since 1979, average workweeks have been absorbing more of a given “shock” to output demand than in previous cyclical swings (Glosser and Golden, 1997). While the response of work hours has become even more concentrated immediately following “shocks” to output, the lag time of the employment response to increased output demand has lengthened, particularly in expansion phases (Glosser and Golden, 2004). This has produced more extended periods of “jobless recoveries” following recessions (Glosser and Golden, 2005). This may reflect in part the absence of a policy of work hours reduction or restraint, which might offset the factors that are stoking demand for longer hours and delaying hiring, such as skill-upgrading of jobs and “lean staffing” strategies during upturns, and reduce employment more than it reduces hours, during downturns.

A simulated impact of various working time reduction policies computed the impact of a policy of reducing the number of days in the workweek to four days (Hamermesh, 1996). Average hours would decline by 18 to 20 percent (the largest reductions in hours would occur in certain private industries—coal mining, oil and gas, water transport and textile manufacturing industries). If instead, working time was reduced via a restriction to a 7.5 hour maximum workday, average hours would be reduced by only 6 to 9 percent (the largest impact in manufacturing would be in the cement, dairy products and beverage industries). The change in employment necessary to keep output constant, following an imposed reduction in work hours, either through reducing the number of days or number of daily hours, was estimated. Generally, output could be made up through relatively smaller increases in employment than increases in daily hours. The simulated loss of output found was large, the smallest being as high as 4 percent. Thus, a four-day workweek might well create jobs, but at a steep cost in terms of reduced output. A mandatory reduction in the length of daily hours, however, has a less severe potential impact on output. To make up the lost output following a mandated shorter working day, the number of days per week need only be raised by 1.5 to 5 percent. Indeed, it would be relatively easy to restore the lost output by increasing employment, but more difficult to do so by raising daily hours. It concludes that employment might be expanded significantly following a mandated reduction in daily hours (hours per day).

In Canada, it was estimated that if only half the 6.4 million hours of overtime worked by Canadian workers could be converted into full-time jobs, employment would be boosted by up to 80,000 individuals. A simulated 10 percent reduction in standard hours phased in over five years would reduce the number of unemployed by 4.1 percent, with only a negligible impact on output growth and inflation (Donner Commission, 1995). However, cutting in half the existing overemployment rate, from 10 to 5 per cent of workers, i.e., redistributing hours from the overworked to the underworked, would have limited ability to create new jobs filled by the currently unemployed, albeit it may still be worthwhile public policy (Drolet and Morissette, 1997). In addition, a natural experiment of sorts occurred between 1997 and 2000 in the Canadian province of Quebec. It reduced its standard workweek from 44 down to 40 hours, with its main aim of stimulating employment growth. The Quebec policy involved no mandated wage increases to compensate workers for the reduced earnings due to fewer hours. The
evidence suggests that weekly hours did experience a 20% reduction (among full-time workers) in the weekly hours worked beyond 40. However, the policy did not appear to raise employment at either the provincial level or within industries where hours of work were affected most (Slaterud, 2007).

Most countries in Europe have initiated both work sharing policies, designed to spread employment opportunities. Indeed work sharing is among the most common forms of response to downturns in employment (Cazes et al, 2009). Like many of the conventional, microeconomic-based studies, projecting the effects of restricting work hours, such as a reduction to no more than 35 hours per week, depend largely on the set of assumptions adopted regarding the productivity, cost and wage effects. For example, if output per worker remained at least 90 percent of its previous level, employment would grow by 6.3 percent rather than decline if output shrank substantially. Moreover, if total wages paid would decline by 1.4 percent, employment would actually grow by 13.3 percent (Fitzgerald, 1996). When hours reduction is accompanied by an employment subsidy, to reduce quasi-fixed costs of employment, while attempting to maintain worker’s take-home pay by preventing downward adjustments in workers’ earnings, it may be likely to increase employment (Erbas, Chera and Sayers 2001). Studies from the 1980s indicate, on average, a positive employment effect of at least 40 percent and perhaps as high as over 70 percent of the initial change in hours (Bosch and Lehn Dorff, 2001). Larger-sized reductions in hours appear to have greater employment effects than only marginal changes in hours. The net employment effect of an imposed reduction in hours is estimated to be positive in 8 of 12 industries examined in the UK (Booth and Ravallion, 1993). In the UK, five of six studies found negative elasticities, ranging from -0.39 to -1.47 between actual hours reduction and subsequent employment increases. The computed average among all six studies is an elasticity of about -0.60, meaning that a ten percent decline in hours is associated with a six percent increase in employment in these samples (Andrews and Simmons 2001). In a panel of 52 engineering industries over 1978-82, robustly negative estimates of the employment elasticity with respect to standard hours were found (Hart and Wilson 1988). For the majority of firms in the sample who use overtime hours, the elasticity of employment averaged -0.50. However, for the nine firms offering no overtime, the elasticity was actually positive. An important precondition for reduced standard hours to translate into jobs appears to be that firms start out having overtime hours, which presumably cushions against unit labor cost increases when they convert hours into jobs. One study simulates the reverse case of people working more hours for the same pay, and projecting whether employment will increase or decrease, and finds that no positive effect on the number of persons employed can be expected (Conrad, et al 2008). In Germany, labor unions began to reduce standard hours on an industry-by-industry basis, in an attempt to raise employment. Analysis of industry-level data suggests that such “work sharing” may have reduced employment in the period 1984–1994, but this was because the hourly wages rose enough to offset the decline in actual hours worked (Hunt, 1999).

The most studied policy is reductions in the standard workweek (International Labor Review, 1993; Boissonat, 1996). Most prominent was the 2000 reduction from 39 to 35 hours per week in France. It was supported by concurrent wage subsidies that effectively lowered nonwage labor costs for employers as well as providing employers opportunities to vary hours per week above the standard, as long as they averaged 35 over a several month period. Its success in raising employment is at least partly attributable to the wage cost moderation (Schreiber, 2008). The employment level grew faster than its forecast and the unemployment rate fell more than would have been predicted. Wages and labor demand afterwards slowly recovered from the initial shortening of working hours, as output appeared to be relatively unaffected (Logeay and Schreiber, 2006). The most widely cited figure regarding the employment effect is a net creation of 350,000 jobs, and perhaps as many as 500,000, above the job creation that would have occurred even without the working time reduction (although this fell short of the government’s original promise and forecast of 700,000 jobs over three years, in large part because work time fell less than originally expected, as many firms avoided a full 10 percent cut in hours by changing their way of calculating work time, and also because firms were no longer required to hire at least 6 per cent more workers to receive government aid, as they were in the first round of workweek cuts—allowing companies to absorb much more of the impact than expected through hourly productivity gains). The most valid estimates of net employment gains were 6.0 to 7.5 percent in firms that benefited from the first round (Aubry I and 1996 Robien law incentives), and an initial estimate of about 3 percent in firms that reduced hours without these additional financial incentives. Not only did the policy package avoid labor-cost increases for businesses, but most of the 35-hour
employees cited quality-of-life improvements despite the wage moderation, greater variability in their schedules, and intensification of work (Hayden, 2006).

In Portugal, in 1996, the maximum standard workweek was reduced from 44 to 40 hours. For workers involved, the reduction in Portugal appears to have resulted in a reduced separation rate (the sum of layoffs and quits). The fact that monthly earnings remained constant for workers also meant that some workers actually faced a higher risk of job loss—those who were working fewer than 40 hours, however, not those whose hours were reduced as a consequence of the law. It also increased hourly wage rates, which kept workers’ monthly earnings approximately constant. The working hours reduction also affected workers working less than 40 hours per week, who became more likely to lose their job. However, those whose hours were reduced as a consequence of the law were not (Raposo and van Ours, 2010). The Brazilian government is now considering a similar reduction of 44 down to 40 hours per work as the standard, along with an increase in the overtime wage premium. The latter may help accomplish these ends, perhaps even by itself, since a simulated tax-rate of 12% of overtime wages was found to reduce the workweek from 40 to 35 hours. Indeed, this tax change was projected to boost employment by 7 percent, however, it also reduced productivity per worker by about 4 percent (Osuna and Ríos-Rull, 2003). In Venezuela in 1991, the standard length of the workweek was reduced, but only for blue-collar workers (Bujanda Leon Fernandez and David Fairris, 2011). The impact of this legislation on blue collar type employment was estimated (with panel data and a difference-in-differences identification strategy), to directly estimate transitions into employment for affected workers. Work sharing policies were successful in raising blue-collar employment in Venezuela, by a moderately sized but statistically significant amount. Results suggest a 6 percentage point increase in employment in the second period following the reform.

Recent OECD analysis found that that short-time work polices (such as Koyo-chosei-jyosei-kin) in Japan, preserved jobs that otherwise would have been lost in the recession (OECD, 2010b). It identified a key source as the encouragement of employers to adjust to lower demand by reducing workers’ hours rather than through layoffs. The OECD concluded that in up to 24 countries, where some type of work-sharing scheme was operated during the recession, such measures were effective in preserving jobs, at least those of regular workers (OECD, 2010a). In most countries, the largest part of the reduction in average working time occurred outside of short-time work schemes, however, such as reduced overtime hours, employer-initiated reductions in standard working hours for full-time workers and increased numbers of involuntary part-time workers (Houseman, 2011). Estimation results of the impact of short time working schemes during the 2008-09 recession found clear evidence in 11 of 19 countries, that permanent (but not temporary) jobs were preserved during the economic downturn. They also increased the incidence of average hours reductions among permanent workers. There was a smaller marginal effect on permanent employment for a given 10% reduction in output during the crisis period in countries with short-time work schemes relative to countries without such schemes (OECD, 2010a, Table 1.4).

The Great Recession in the US: Employment Reduction Still Dominates Hours Adjustment

Employment adjustments bear the brunt of recessions, particularly the most recent crisis, in the US. The rate of layoff pattern is quite similar in the durables and non-durables production industries. It contrasts against average weekly overtime hours in manufacturing, Figure 1 shows rates of layoffs (from JOLTS data that began only in 2000, and thus are not used further). Over the course of the 2007-2009 recession, aggregate weekly hours of work (total employee-hours), plummeted by over 9 percent (Kroll, 2011). Employment reduction comprised 6.6 percent of that change while hours constituted only 2.6 percent. The average workweek fell but by less than 1 hour, in the total private sector. The domination of employment reduction as opposed to hours reduction was apparent in the manufacturing sector, as well as construction. This occurred despite rather sizable adjustments downward in the workweek in the goods-producing sectors. However, hours adjustment occurred more in sectors where employment was not declining—utilities, education and health services. Thus, while hours of work declined in the recession, it makes up for no more than roughly a quarter of the overall adjustment in labor input that occurred, in the US.

Figure 1: Rate of Layoffs and discharges, Total private employment, 2000-2011, Seasonally Adjusted
On the other hand, weekly overtime hours have not been eliminated, despite being in a slump. They did drop by an hour over the recession period, at least in the sector for which data are collected, manufacturing (see Figures 2 through 5). For the production and non-supervisory workers, the drop and subsequent increase appear to be somewhat starker in contrast to all employees, but otherwise similar in pattern.

Figure 2: Average Weekly Overtime Hours, All Employees Manufacturing, Current Employment Statistics (CES) data, 2006-2011

Figure 3: Average Weekly Overtime Hours, All Employees, Durable Goods Manufacturing, Seasonally Adjusted, 2006-2011.

Figure 4: Average Weekly Overtime Hours of Production and Nonsupervisory Employees Only, Durable Goods, Seasonally Adjusted, 1990-2011.
In the United States, there has been a labor market-induced, "work-sharing" of sorts, that is haphazard, reflecting cyclical forces. This unlikely reflects neither a shift in worker preferences nor a public policy intention. Indeed, underemployment rose markedly during the Great Recession of 2007-09, and persists in the subsequent "jobless recovery," in the US. By the end of 2009, the share of the work force on part time hours "for economic reasons" peaked at over 6 per cent. In specific, a greater proportion of workers are employed "part-time" (defined by the US Bureau of Labor Statistics (BLS) at 1-34 hours per week for "Economic Reasons," specifically due to "Slack Work or Business Conditions." Figure 6 displays the recent, unprecedented spike in the number of such workers. That number remains about double the number it was pre-recession. Over 7 million who reported in 2009 that their less than full time hours are due to, "slack work or unfavourable business conditions" (including seasonal declines in demand), plus another just over 2 million workers who "could only find part-time work."

Figure 5: Average Weekly Overtime Hours of Production and Nonsupervisory Employees, Nondurable Goods, seasonally adjusted, 1990-2011.

![Average Weekly Overtime Hours Chart](image_url)

Source: Bureau of Labor Statistics, URL:

The part-time work force that is willing to work for longer hours for the additional income is surely just a subset of the "underemployed," those workers who prefer more work hours in order to earn more income, regardless of whether they are employed at full-time or part-time hours (see Golden, 2006). During the latest recession, this has occurred largely as an unguided adjustment by employers, some of which has been through reduced hours in companies’ full-time workforces, and undoubtedly, also in their non-regular work forces—part time and temporary workers. In 2009, the average number of weekly hours declined to 33 hours, the lowest level on record since data collected. Average hours of those employed in the cyclical bellwether industry of Temporary Help Services showed a dramatic dip from over 34 in Fall 2008 down to 31.9 hours in September 2009. In contrast, the average workweek in manufacturing, and in particular overtime hours, dipped by only about half an hour over the course of the recession. Thus, the cyclical downturn was absorbed by nonsupervisory and production workers’ hours in the more cyclically sensitive, part-time and temporary type of jobs. Thus, the challenge of promoting work-sharing is that while it has the potential to curb layoffs and reduce unemployment, employers already do so,
for some workers, in downturns. However, this is done in a way that exposes more workers to the risk of becoming “underemployed,” working shorter hours or fewer days or weeks than a worker prefers.

Table 1: Heightened Underemployment, Part-time for Economic Reasons, by Major Industry

<table>
<thead>
<tr>
<th>Sector</th>
<th>Average Underemployment, 2000-2007</th>
<th>Average Underemployment, 2010</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining</td>
<td>1.0%</td>
<td>1.45%</td>
<td>1.44</td>
</tr>
<tr>
<td>Construction</td>
<td>4.64%</td>
<td>11.49%</td>
<td>2.47</td>
</tr>
<tr>
<td>Durable Goods Manufacturing</td>
<td>1.45%</td>
<td>5.05%</td>
<td>3.51</td>
</tr>
<tr>
<td>Non-Durable Goods Manufacturing</td>
<td>2.42%</td>
<td>4.09%</td>
<td>1.70</td>
</tr>
<tr>
<td>Wholesale and Retail Trade</td>
<td>3.44%</td>
<td>8.63%</td>
<td>2.51</td>
</tr>
<tr>
<td>Transportation and Utilities</td>
<td>2.63%</td>
<td>5.03%</td>
<td>1.90</td>
</tr>
<tr>
<td>Information</td>
<td>1.82%</td>
<td>4.15%</td>
<td>2.29</td>
</tr>
<tr>
<td>Financial Activities</td>
<td>1.25%</td>
<td>2.46%</td>
<td>1.97</td>
</tr>
<tr>
<td>Professional and Business Services</td>
<td>3.03%</td>
<td>5.75%</td>
<td>1.90</td>
</tr>
<tr>
<td>Education and Health Services</td>
<td>2.39%</td>
<td>4.60%</td>
<td>1.96</td>
</tr>
<tr>
<td>Leisure and Hospitality</td>
<td>6.47%</td>
<td>15.59%</td>
<td>2.39</td>
</tr>
<tr>
<td>Other Services</td>
<td>3.91%</td>
<td>8.79%</td>
<td>2.26</td>
</tr>
<tr>
<td>Public Administration</td>
<td>0.67%</td>
<td>1.89%</td>
<td>2.82</td>
</tr>
</tbody>
</table>

Source: (Konczal, 2010).

The “underemployment rates” by industry illustrate the degree to which shorter hours has become more prevalent, for cyclical reasons, roughly doubling across most industries. It also appears that the climb in “involuntary part-time” by 2010 was steepest in public administration, construction, trade and information services. With the exception of Leisure and Hospitality and Other Service industries, these also happen to be the sectors with the highest rate underemployment, too. Underemployment rates largely tend to mirror, although not precisely, the industry pattern of unemployment. Unemployment in this recession has been considerably more concentrated in construction, and is also above the national average in the manufacturing, agricultural and mining, professional and business services and recreation and leisure industries (BLS, 2011).

These patterns of hours suggest that even though some formal work sharing plans are being adopted by some companies in the 23 states that now have STC programs, employers have adjusted hours downward, just as workers seem to prefer more income. Perhaps average hours might have dipped even further, if not for some companies’ formal implementation of some guaranteed minimum average number of hours per week. Companies might be implementing their own form of work sharing. However, while it may be attempt to avoid or forestall layoffs, it might also be adopted avoid future hiring, when demand for their labor input begins to rise, by leaving room for weekly hours to be adjusted upward later.

The Time Series Relationships between Output, Hours, Employment and Layoffs: Case with US Data

Over the business cycle, hours of work are known to complement employment, decreasing when the economy is slowing down and rising when the macroeconomy is recovering or expanding. However, working time is also a potential substitute for adjustment in employment during recessionary periods, with reduced hours acting as a brake on reductions in jobs. This is the essence of the potential for work-sharing to spread employment opportunities. There are many reasons why jobs may not be directly substitutable for reduced hours, at least proportionately, explored in detail, above. Indeed, even without these complications, since both workweek lengths and employment levels are moved by the same, business cycle forces, it may be all but impossible to disentangle hours, employment and layoffs. Figure 7, illustrates the inherent challenge—output variation, as captured by the industrial production index, is closely tied to the length of the workweek, in a bi-directional way. Figure 7 shows the percentage changes from the previous year in output, employment and the workweek. Workweek adjustments immediately follow output changes (e.g., Glosser and Golden, 1997), absorbed mainly in the first month following
an output increase or decrease. The complicating factor is that longer hours not only eventually signal increases in new hiring by employers, but they often result in additional income, particularly among non-supervisory and production workers, which in turn will be spent and fed back into greater output. The converse case would be replicated in the downward direction when average hours per worker contracts for a given level of employment.

Notice that in the shaded areas of Figure 7, average weekly hours (in manufacturing, blue line) dropped in the recession, but the extent was dwarfed by the precipitous drop in output (green line) and employment (red line). Indeed, the employment level change appears to closely track the change in output with a lag of about a couple of months. In the previous two recessions, a workweek drop preceded the drop in output employment. But in the recent recession, the workweek drop was more marked, but led an eventual recovery first in output then employment. Employment clearly has bounced back in mid-2009 to 2011, but the magnitude has not been enough to avoid being characterized as another “jobless recovery.” While the workweek appears to have been more responsive to the drop in output (“flexible” or “variable”), it still pales in comparison to the variation in employment in the US.

Figure 7: Average Weekly Hours, Employment and Output, 1990-2011

We first observe simple correlation associations. We expect that these will be positive, because of the inherent simultaneity between output, hours and employment. What we may find, however, is that some sectors may exhibit less positive, zero, or perhaps even an inverse correlation. The more negative, or smaller positive, suggests a greater potential for substitutability. Table 2 shows correlations between changes in both hours and employment, lagged for 6 months each. It observes four periods, the whole decade from 2000-2011, just the latest 2007-09 recession, the overall “slump” from 2007-11, and just the recovery period following the recession. Such potential substitutability appears to be slightly greater in non-durables type of manufacturing than in durables. Substitution between hours and employment is most apparent, when the scope includes the entire decade, in Construction and in the Information industries. It appears to be greater also in certain industries during the recession (and slump since then)—Information and Professional and Business Services. Interestingly, negative correlations are more apparent during the 2009-11 recovery period. That suggests that employment has been restrained by the increasing length of the workweek that is part of the recovery. Thus, work-sharing may be just as powerful a tool to promote employment, and counter a jobless recovery, after a recession as it might be during it.

Table 2: Correlations between Weekly Hours and Employment Levels, 6 months of lags

<table>
<thead>
<tr>
<th>Decade</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
</table>

(source: FRED-Federal Research Economic Data)
systems are used to construct dynamic, “orthogonalized impulse response” (IR) functions.

reflect the actual nature of such adjustments in labor input, after an output change. Then, the parameters of each of the est

average w

related variables. Each equation in an “ordered VAR system” is then estimated recursively. The VAR system is composed of output (Q), average workweek (H), employment of production workers (E) and real weekly wages (W). The data are ordered in that exact sequence, to reflect the actual nature of such adjustments in labor input, after an output change. Then, the parameters of each of the estimated four VAR systems are used to construct dynamic, “orthogonalized impulse response” (IR) functions.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Durables manufacturing</th>
<th>Non-Durables manufacturing</th>
<th>Wholesale/Trade</th>
<th>Retail Trade</th>
<th>Transp and Warehousing</th>
<th>Utilities</th>
<th>Financial Activities</th>
<th>Education and Health Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recession</strong></td>
<td>0.176</td>
<td>0.206</td>
<td>0.233</td>
<td>0.220</td>
<td>0.273</td>
<td>0.262</td>
<td>0.239</td>
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<tr>
<td><strong>Non-Durables manufacturing</strong></td>
<td>0.050</td>
<td>0.107</td>
<td>0.123</td>
<td>0.135</td>
<td>0.089</td>
<td>0.074</td>
<td>0.166</td>
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<tr>
<td><strong>Wholesale/Trade</strong></td>
<td>0.151</td>
<td>0.161</td>
<td>0.184</td>
<td>0.169</td>
<td>0.161</td>
<td>0.174</td>
<td>0.125</td>
<td></td>
</tr>
<tr>
<td><strong>Retail Trade</strong></td>
<td>-0.031</td>
<td>0.007</td>
<td>0.082</td>
<td>-0.018</td>
<td>0.103</td>
<td>0.035</td>
<td>0.029</td>
<td></td>
</tr>
<tr>
<td><strong>Transp and Warehousing</strong></td>
<td>0.002</td>
<td>0.116</td>
<td>0.226</td>
<td>0.069</td>
<td>0.130</td>
<td>0.155</td>
<td>0.131</td>
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<tr>
<td><strong>Utilities</strong></td>
<td>0.109</td>
<td>0.061</td>
<td>0.021</td>
<td>-0.087</td>
<td>0.013</td>
<td>0.078</td>
<td>-0.127</td>
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<tr>
<td><strong>Financial Activities</strong></td>
<td>-0.054</td>
<td>-0.080</td>
<td>0.018</td>
<td>-0.122</td>
<td>0.055</td>
<td>0.044</td>
<td>-0.113</td>
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</tr>
<tr>
<td><strong>Education and Health Services</strong></td>
<td>0.045</td>
<td>-0.049</td>
<td>-0.018</td>
<td>0.130</td>
<td>0.013</td>
<td>0.018</td>
<td>0.051</td>
<td></td>
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</tbody>
</table>

Next, we model the relationship between hours and employment in a more sophisticated fashion, using time series analysis techniques. In order to obtain impulse responses, we apply a Choleski decomposition to a priori impose the following causal ordering \( Q, H, P, W \): \( Q \rightarrow H \rightarrow P \rightarrow W \). This technique will permit us to observe the existing pattern of both hours and employment following a “shock” (one-time adjustment) of a given (“unit”) size in output (Q, industrial production index). It will also allow us to observe the response if the “shock” were to begin with a shock to average workweeks, in other words, a simulated intervention such as work-sharing. However, observing this will be compounded by the likelihood that a reduction in work hours, if not accompanied by wage
compensation, then feeds back eventually negatively to output demand, reflecting the simultaneity problem that makes it so difficult for us to isolate the substitutability of hours for employment.

We first run this model on the aggregates for which monthly data and longer time series data are available, notably the manufacturing sector, then the durables and nondurable goods production sub-sectors. We explore whether sectors that experienced a greater downward adjustment in hours also underwent a subsequently smaller decline in employment, all else constant. The estimates include both the size of the hours and employment responses and, importantly, the lengths of lag times in the response (represented by the black line, in the middle). Finally, we attempt to infer the extent to which a forced shock downward in hours—e.g., a temporary policy of work-sharing, might be expected to impact positively on employment, and how that might vary by sector, including those outside of manufacturing. The impulse response (IR) estimate will be considered the “realistic case scenario,” whereas the upper and lower bounds of the confidence intervals will reflect the “best case scenario” and “worst case scenario.”

Figure 8, bottom left box, shows that a given unit increase in the level of output would raise the workweek by about 0.20 to 0.30 of a unit. The effect of that output increase declines after about a year, and dissipates to zero after about the 15th month. However, the size and length of the effect of an output shock on hours pales in comparison to the effect of output on employment adjustments, shown in the top right portion of Figure 10. The effect on employment, however, builds only gradually, peaking at about the same month after an output shock’s effect on hours begins to decline. Moreover, the effect on employment, though lagged, is in scale about three times the size of the effect on hours. This suggests that, one, at least after some lag time, employment adjustments dominate hours adjustments among employers in manufacturing, and two, after about a year, the substitution within labor input, from hours to employment, starts to settle in. Both results subtly point to the potential utility of work-sharing measures—which would both raise the responsiveness of workweeks, vis-à-vis employment, so that more of the adjustment is absorbed through hours, and perhaps delay the time between employers’ adjustment of hours and adjustment of employment during downturns, and quicken the lag time during upturns.

**Figure 8: Impulse Response of Hours (H) and Production Work Employment (P) to a shock in Output (Q)**

![Figure 8: Impulse Response of Hours (H) and Production Work Employment (P) to a shock in Output (Q)](image)

Figure 9 shows the impulse responses during expansion periods only, to distinguish between the entire period and just the expansion periods. By default, we can observe if the response to a shock would behave differently during the downturn phases of the cycle (since data back to the year 1990 do not provide sufficient months of downturns to yield reliable degrees of freedom for generating tests of statistical significance, unfortunately). The behavior is somewhat different. The box on the lower left shows that the response of hours (H) to a one-unit shock in output (Q) in a given month is slightly less than in the overall period, about 0.20 in the initial month following that shock. In the next 12 months, the effect dwindles, reaching zero at about the 12th month out (after which the confidence interval suggests that the impulse response is no longer statistically significant). By default, this suggests that hours adjustment is a bit stronger during downturns than upturns. In the top right box, production worker employment (P) adjustment appears to be far smaller, only about half in scale (only 0.40), and also more persistent (significant for over four years after the shock as opposed to only three), during upturns. This suggests there is

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2 Monte Carlo integration is then used to compute the standard errors of the impulse responses (IRs). These standard errors are then used to construct 95 percent confidence intervals, around which we can judge if and when the IR is statistically significant or not. We observe the simulated impact of the shock to output, and hours, for the 12 months following such a one-time, one-month shock.
perhaps some room for more work-sharing to both curb and delay downward employment adjustments during the downturn stages. It also accounts for the recently observed “jobless recoveries” during upturns, with longer lagged responses in employment to a given increase in output demand. For the figures, include the sector. For example, instead of

**Figure 9: Impulse Response of Hours (H) and Employment (P) to a shock in Output (Q), Manufacturing Sector Expansion periods**

![Graph](image)

Figures 10 and 11 apply data from 1990-2011 to distinguish the behavior of the two main subsectors of manufacturing, durables and non-durables goods production. It portrays the adjustment of employment and hours, to both a unit-sized shock in output and a shock in hours. Figure 10 shows that a shock to output in Durables Manufacturing appears to initially impact on hours, at .30 the size of the shock, which then decreases in size until wiped out after about 15 months (when the lower bound of the confidence interval crosses zero, suggesting that the IR cannot be concluded to be above zero). Conversely, the initial impact on employment is negligible in the immediate months following a shock, but the effect builds gradually over time. It peaks at about the same time the effect on hours has run out. This suggests that there is a substitution of employment for hours, but only after a several months lagged response, to a one-time shock in output.

What about the effects of a given shock in average weekly hours? Using this scenario to capture the potential effects of work-sharing policies and practices is complicated. The reason is that adjustments in hours, particularly among the non-supervisory and production workers, is directly and positively associated with income, which when spent, may well pull up output demand, and then indirectly, also the level of hiring and thus employment. Consequently, it is likely, because of this complementarity, that a positive (negative) shock to hours might yield a positive (negative) response in employment. However, if we can somehow screen out the size of the effect of hours on output demand (top right graph), the net effect is more likely to reflect the potential effect of altered hours on employment. In the case of durables, Figure 11 shows that this effect of hours on output, however, is not statistically significant. Thus, a shock in hours in this sector has not been associated with inverse adjustments in employment (bottom right); indeed there is an indication to the contrary. Nevertheless, during expansionary periods, an increase in hours does in fact raise output, at least after a lag time of a few months. Thus it might appear that the potential employment creation effect of limiting hours (via work-sharing) is more present in the recovery and expansion phases in the cycle than in the downturn. This may be curious, but it does suggest that introducing more work-sharing, if sustained through a recovery, could promote a more hastened switchover among employers to hiring than might have occurred otherwise.
In the Non-Durables sector, the magnitudes of the responses of both hours and employment appear to be more muted (see Figures 12 and 13), but the pattern is similar to Durables. Employment responses peak about a year after an output shock, about the same time that its effect on hours dissipates fully. The effect on both hours and employment degenerates more quickly, however, than it does during expansionary phases in the durables sector.
A superior way of replicating the effect of work sharing using VAR estimates, would be to shock hours in the downward direction, simultaneously with a shock downward in output, to simulate a recession, using only data from months in downturn (contraction) periods. To yield more observations, we added data back to 1980 and considered “downturn” periods to be months of “negative growth gaps,” where output grew below the average, which corresponds closely to the traditional NBER recession dates. Figures 14 and 15 display the results of this exercise, for Durables and Non-durables, respectively. Figure 14 displays the most crucial result of this research: in the Durables sector, when only an output shock occurs, employment decreases substantially (blue line). The blue impulse response suggests that employment in the overall durables manufacturing sector, if there were no corresponding reduction in the workweek, drops by almost one percent following a one percent shock downward in output. However, when a downward hours shock is introduced at the same time as the output shock, employment responds positively, for at least 10 months following the shock. This represents the “realistic case” scenario (small sample size precludes the possibility of generating reliable confidence intervals, however). Shocking hours downward by a unit, proportionally equal to the unit decline in output, is associated with a moderately sized employment gain which builds up to about 0.80 gain in the sixth month following the shock. The difference between the blue and red lines are quite consistent, indicating an employment creating effect. Given the level of employment in durables manufacturing is 8.8 million before the start of the recession, this translates into an estimated 80 thousand jobs lost. However, had there been an accompanying one percent reduction in work
hours with the downward output shock, the red line implies that, within six months, employment would have been higher than otherwise. This translates roughly into 26 thousand jobs potentially saved in durables manufacturing, if workweeks would have declined proportionally with a given output drop. This preliminary estimate is our key finding that would support the employment case for work sharing. In addition, if workers’ earnings were reduced proportionately with output, this would have somewhat exacerbated the employment decline and limited the prevention of employment loss. This implies that protecting wages from a proportional decline would prevent some employment loss. In the non-durables goods industry, however (Figure 15), if an hours reduction accompanied a negative output shock, the subsequent drop in employment does not appear to be mitigated. There is, however, a slight moderation of the employment decline that would have occurred without hours being shocked downward, provided the output and hours reductions are accompanied by reduced wages. This neutralizing effect occurs particularly within the first month or two following the negative shock to output.

**Figure 14:** Impulse Responses of Employment to Simultaneous Shocks in Output and Hours, Durable Manufacturing, Contraction and Slowdown periods only, 1980-2011

![Employment Responses during Contractionary Periods, Durables Manufacturing](image)

**Figure 15:** Impulse Responses of Employment to Simultaneous Shocks in Output and Hours, Non-Durable Manufacturing, Contraction and Slowdown periods only, 1980-2011

![Nondurable Employment Responses during Contractionary Period](image)

**Figure 16:**
Figures 16 and 17 show the impulse responses in the Durables and Nondurables Manufacturing sectors, respectively, to a downward shock to hours when there is an upward shock to output. In the durables manufacturing sector, reducing hours during an expansion, may have little employment creation effect, indeed may have counterproductive effects unless they are accompanied by corresponding reductions in wages. In the nondurables sector, in contrast, reducing hours in an expansion actually does slightly promote employment, eventually, beginning in about the 9th month following the output gain. Reducing wages (green lines) would work against the employment creation during expansions in the nondurables sector.

In sum, there appears to be some promise for preventing severe employment declines during downturns with some form of work sharing—a reduction in workweek lengths in conjunction with downturns in output—in creating employment during downturns. This would occur most profoundly in the Durable Goods production industries in Manufacturing (although not in the Non-Durables industries). Aside from the downturn periods, employment appears to take a long time to substitute for hours increases, particularly during expansions. The inertia in employment clearly also reflects forces other than the degree of variability in average work hours. However, in addition, there are some nuances in the patterns by sector. Examining the effect of a potential unanticipated alteration in average work hours is difficult because it cannot be completely disentangled from the effect of such a shock on output demand. Nevertheless, there appears to be no net negative effects on employment, once consideration is taken that output moves with hours. Thus, realizing the potential positive effects of work-
sharing on employment are going to be a more targeted and nuanced rather than one-size fits all affair. It would vary by industry type and stage of the business cycle. The existing patterns of adjustment in the US suggest that hours reduction may be a more powerful tool in terms of protecting or increasing employment levels when the economy is heading into a recession, in durables manufacturing and in nondurables manufacturing when it is already recovering from a recession.

Future empirical research along these lines ought to broaden sample to earlier years, so that disaggregated industries could be identified within the durables manufacturing sector where the impact of hours reduction during recessions would be most fruitful for preserving or creating greater levels of employment with subsidized work-sharing efforts. Further research should also incorporate into the VAR model some additional variables, such as overtime weekly hours and multi-factor productivity indexes (available quarterly), to account for some further nuances in the relationship between hours and employment. Finally, it needs to be explored why the Durables goods sector behaves so differently than Nondurables goods during recessions and also during expansions.

**Work Sharing Policy in North America Today**

Interest in work sharing tends to revive with every recession and descriptive analyses of the programs follow a few years afterward, usually touting their favourable features or results (e.g., McCarthy and Rosenberg, 1981; Kerachsky et al, 1985; Best, 1988; Golden, 1990; Meltz, Reid, and Swartz, 1981; Nemirow, 1984; Owen, 1989; Hunnicutt, 1992). Estimates of their employment impact date back to President’s Reemployment Agreement (PRA) of 1933, which appears to have created nearly 2.5 million new employment opportunities, in around four months. However, the program also required firms to raise hourly wage rates, offsetting close to half of these gains. Furthermore, most of the remaining employment gains were wiped out after cartel-oriented industry-specific codes of fair competition supplanted the PRA (Taylor, 2011). Although cutbacks in work hours and work sharing policy was encouraged in the US and especially Canada in the late 1970’s and early 1980’s, it turned out to be an ephemeral (Jacoby 1985; Huberman, 1997), unlike in Europe, where short-time work schedules were prevalent and accommodated workers’ preference for fewer work days ().

Formal social insurance legislation in Europe incorporated already widespread use of work sharing arrangements, whereas in the Canadian UI system, short-time workers were integrated only in the 1990s (Huberman, 2004). In the STC program in California during the 2001 recession, 67 percent of firms who used STC were in manufacturing, but also that even within manufacturing, just over 5 percent of firms in groups with UI used STC-sponsored work-sharing (Macurdy, et al 2004). Since some firms do not belong to a UI group, this amounted to only 3.2 percent of all firms in the State (see Table 3). Nevertheless, a few of the industries stand out in terms of use intensity, in particular, electronics and primary metals manufacturing, and to a somewhat lesser extent, instruments, fabricated metals and furniture. Table 3 shows the breakdown by industry, which may be nationally representative for the later recession in 2007-09, but not necessarily so. Across the entire US, while use of work sharing with STC has been slight, it spiked during and immediately following the last two recessions (see Gray, 1998; Macurdy, et al 2004; Balducchi and Wanderer 2008; Messenger, 2009; Vroman and Brusentsev, 2009; Shelton, 2011). It has generally been adopted more widely in the manufacturing and wholesale trade industries. Through the end of 2008, the STC program rarely reached up to even 1 per of unemployment benefits paid annually. This ratio did rise to 2% in 2009 and 1.2% in 2010. In the recession for the years 2008-09, about 22 thousand employees were involved in the 23 States’ STC programs, amounting to 0.73 per cent of the total full-time equivalent (FTE) change in private sector employment in that period. Whilst small as a proportion of production worker employment in manufacturing, it constituted a less trivial looking proportion of almost 5 per cent.

In Canada, use of the Work Sharing program between 1990-91 and 2001-02, measured as the proportion of all job separations, is almost as meager as in the US. The number of participants ranged from a low of 7,683 in 1997-98 to a high of 112,357 in 1990-91. The corresponding average number of layoffs attributed to a shortage of work was about 3 million a year, and one half of these layoffs resulted in an unemployment insurance claim. This translates into work-sharing claims being only 1.2% of all layoffs and only 2.4% of all claims. Nonetheless, work sharing arrangements involved almost 300,000 workers and almost 11,000 employers since 2008, averting thousands of layoffs (Georgetti and Myers, 2011). In Canada, the majority of participants (67%) in the Work Sharing program were employed in the manufacturing sector. The incidence of work sharing in manufacturing was almost four
times as high as in the entire workforce (8.4% vs. 2.3%), and almost those rates in wholesale and retail trade and business services, though trivial elsewhere (Human Resources and Skills Development Canada, 2004).

Table 3:

<table>
<thead>
<tr>
<th>Industry</th>
<th>% of All Firms in CA</th>
<th>% of All Firms with Work Sharing</th>
<th>% of All Employees in CA</th>
<th>% of All Employees in Work Sharing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food and Kindled Products</td>
<td>5.5%</td>
<td>6.1%</td>
<td>0.6%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Apparel</td>
<td>1.7%</td>
<td>1.1%</td>
<td>1.8%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Lumber and Wood Products</td>
<td>1.3%</td>
<td>1.0%</td>
<td>0.4%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Furniture</td>
<td>3.0%</td>
<td>4.0%</td>
<td>1.5%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Paper Products</td>
<td>5.5%</td>
<td>3.3%</td>
<td>1.0%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Chemical and Petroleum Products</td>
<td>1.5%</td>
<td>1.5%</td>
<td>1.0%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Leather</td>
<td>3.9%</td>
<td>3.9%</td>
<td>1.0%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Home, Clay, Glass, and Concrete</td>
<td>2.0%</td>
<td>3.0%</td>
<td>1.0%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Primary Metals</td>
<td>3.9%</td>
<td>1.0%</td>
<td>1.0%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Industrial Machinery</td>
<td>11.2%</td>
<td>11.1%</td>
<td>1.0%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Electronics</td>
<td>1.8%</td>
<td>2.0%</td>
<td>1.0%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Transportation Equipment</td>
<td>1.8%</td>
<td>2.0%</td>
<td>1.0%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Miscellaneous Manufacturing</td>
<td>2.0%</td>
<td>2.0%</td>
<td>1.0%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

In Canada, evaluations found an estimated 43 to 67 thousand jobs total were saved by their Work Sharing program, during the years 1989 and 1991, mainly by averting layoffs (Gray, 1996; Needles and Nicholson, 1998). The greater success in Canada speaks to their far more widespread use in Canada vs. the US (Meltz et al, 1987). The scale to which STC is used in Canada is still quite small, however, because the current design of the program limits the demand for work sharing on the part of firms (Siedule, Guest and Wong, 1996). Assessing the efficacy of the program is complicated by the fact that STC may just postpone rather than prevent layoffs. Nevertheless, more individuals likely would have been unemployed, which would have raised unemployment by 0.70 percentage points in 1987, reaching 1.5 percent higher by 1990. In addition, because of the positive health and job satisfaction outcomes of STC recipients versus those laid off, the program’s benefit to cost ratio was estimated to be as high as 2.6 to 1 in the long run, over twice as high as in the shorter term (Freeman, 1998).

An assessment in 1986 of the STC program in California found that the unemployment rate of employees in firms was 11 to 12 percent using the STC, versus 14 percent in the control group of non-users (Vroman and Brusentsev, 2009). In the US, three state UI system using STC displayed varying results (Kerachsky, 1986). Oregon was able to achieve a one-for-one “layoff conversion rate,” where each hour of STC substitutes precisely for an hour of layoff. Arizona’s STC program averted some layoffs, but California’s was found to avert few if any layoffs. Using an approach that relied on surveying employers, the New York State Department of Labor computed that STC averted about 4,000 layoffs per year in the period 1988 to 1994 (Needles and Nicholson, 1998 claim that this figure is implausibly high). Two states that promoted their use among employers more intensively, Rhode Island and Connecticut, the proportions of employment that appeared to have been spared via STC were 4 percent and 2 percent overall and 16 per cent and 23 percent in manufacturing (Housenman, 2011). Rhode Island calculates that the state processed more than 12,000 initial work-sharing claims in 2010. This is estimated to have helped hold its unemployment rate down. Launched in 1992 as WorkShare, the Rhode Island program is credited with averting more than 14,000 layoffs in Rhode Island since 2007. The state’s labor department said work sharing helped avoid an estimated 9,550 layoffs in 2009 and 2010 (Wall St. Journal, Nov. 21, 2011). In 2009, Rhode Island’s employers were five times as likely to turn to work sharing as employers in the other US states with programs, on average. Nationally, according to the US Department of Labor, work sharing programs saved approximately 165,000 jobs in 2009 - nearly triple the number of jobs saved in 2008, plus another 100,000 jobs in 2010. Of the five million jobs lost across the US that year, 220,000 of them might have been saved if the whole country was on a work-sharing program (Housenman, 2011). If as many employees had participated in 2009 at the rates observed in Germany and Italy, the proportion under STC would have been almost one million, avoiding as much as one in eight jobs lost during the recession. Estimating the effects of work sharing programmes on employment may be obscured not only by the fact that they tend to prevent layoffs more than they create new job openings, but their effects might be only narrow and gradual, since successfully implemented programs involve negotiation within organization and changes that are not too abrupt (Messenger, 2009). One prominent US macroeconomic study estimated that
spreading work sharing to all 50 states, for every $1 in federal money devoted to finance it, would eventually result in $1.69 in real GDP one year later (Zandi, 2009).

**Work sharing and Welfare: From spreading work to spreading well being**

The potential benefits of work sharing, particularly when accompanied by partial unemployment compensation, ought to be considered on a wider scope than its effect just on employment and unemployment, important as that is, on the potential increase in overall well-being of those who are or remain employed. First, to the ears of most macroeconomists, it must sound puzzling that work sharing and other forms of hours reduction are judged to be of limited value or even detrimental to the economy because they trigger a boost in average labor (or organizational) productivity. Even if all of an hours reduction is absorbed through the productivity offset rather than employment gains, this may still be a worthwhile economic policy. If unit labor cost increases can be avoided, e.g., via intensification of work or increased capital capacity utilization, hours reduction can be a win-win public policy. It may promote greater welfare, efficiency, and equity, all without harming economic growth. While it may not profoundly reduce the unemployment rate, the social and economic benefits of hours reduction occur through a variety of channels to both individuals and the macroeconomy.

Second, the effects of work hours reduction extend not only to the unemployed, but to those who remain employed as well. The increased non-work time might be welcomed by two groups of workers: one, those who are most at risk of overwork symptoms, such as work stress, fatigue, pain and injury risk, and two, the overemployed, who have an unattained preference for fewer hours of work despite the reduction in income that it entails. Regarding the first group, the potential benefits to the employed of shortened work hours can be ascertained by simply reversing the evidence of the adverse effects, risks and hazards of long working hours on workers’ mental and physical health, including a sense of work-life balance (Dembe et al, 2008; Galinsky, et al, 2005, Golden and Wiens-Tuers, 2010). For example, STC-sponsored work sharing in Canada resulted in better morale, attitudes toward work and management and overall health for the work sharing group in contrast to others (Siedule, et al 1996). Thus, many workers whose hours are reduced will likely experience lessened work stress, fatigue from work and work-family conflict, even if it was not their voluntary choice to shorten their work hours (and income). Reduced stress is all the more likely if hours were involuntarily long, because when employers set hours without employee input, interference of one’s job with family is relatively stronger. Interference is stronger among full-time workers who prefer part-time hours than among full-timers who prefer full-time jobs. In contrast, being part-time but wishing full-time hours (i.e., one form of being underemployed) has no bearing either way on job-family interference. Thus, a full-time worker who has their hours reduced to part-time will lessen their work-life conflict, especially if the reduction is preferred, but it appears to do so even if it is not preferred. When employees feel overemployed, this exacerbates work-family conflict and work stress. Being underemployed, working fewer than desired hours, does not reinforce the adverse effects of long hours on these indicators of welfare (Golden, Henly, Lambert and Wiens-Tuers, 2010). Indeed, workers’ reported overall level of “happiness,” when controlling for workers’ level of annual income, health and all demographic factors, is negatively associated with the number of days per month that they work “extra hours” beyond their usual hours among (hourly paid but not salaried) workers. Happiness also is greater for workers who have flexibility in their work schedule, ability to take time off during the day and whose shifts are regular and predictable. When employees feel overemployed, it exacerbates unhappiness, all else constant. This supports evidence from a work sharing program that reduced hours (and earnings) by 10 percent, which produced a generally favourable employee reaction, particularly for those who used the extra unpaid non-work time for leisure activities (a bit less so than for working in home production or at their workplace). A 4-day workweek (via compressed workweeks, furloughs or extended unpaid vacation time) also produced unexpected gains in job and work-life satisfaction, while also averting some layoffs, in the public sector (Facer & Wadsworth, 2010). Thus, shortened work hours via work sharing, despite decreasing income, is likely to be associated with improvements in welfare among workers even if they are not strictly voluntary, although particularly when the reduced hours would be preferred, since overemployment is a more potentially damaging “hours mismatch” than underemployment (Wooden, Warren and Drago, 2009). The net social welfare gain would be the sum of the increased time off for those employed (welcomed especially by the overemployed), plus the gain for those who are unemployed or underemployed if some of those reduced hours of work can be transformed into more hours and earnings for them.
Toward Targeted, Preference-Based and Industry-Specific Hours Reductions

The foregoing discussion suggests that the biggest gains in overall well-being could be achieved if work-sharing measures, temporary or permanent, were targeted most assertively to particular workers or particular industries—those in which unemployment, underemployment and overemployment rates are highest or most detrimental. Even in the more mild recession of 2001, overemployment was significant in a few sectors (see Golden, 2006). That is, the proportion of workers who report a desire for working fewer work hours even if that means less income, varies by the industry in which workers are employed. Thus, work sharing might be most fruitful, from the point of view of minimizing workers’ well-being loss, when adopted for workers whose hours exceed 40 hours. In the US, there appears to be a strong preference for work hours at precisely the legal standard of 40 hours per week. This is in contrast to countries such as Germany or the Netherlands, where a job with 36 hours appears to be more acceptable to most workers who harbour preferences for either a part-time job or a new full-time job (Bloemen, 2008).

There are many types of employer actions that may lead to reduced work hours per worker, not only involuntary but voluntary arrangements. This includes obvious permanent work-sharing measures, such as a shortening the standard workweek after which overtime pay is owed, for all or a given classification or industry of workers. It also includes options such as limiting mandatory overtime work, requiring that employers provide employees opportunities to reduce to part-time hours at their current job with pro-rated compensation, job sharing measures that allow two employees to split the work and compensation of one full time job, paid and unpaid time off (including vacations, seasonal, sabbatical or other forms of extended temporary leaves). The difference between these forms is likely to be minimal in terms of the potential employment impact, although shorter work days are likely to be less costly for employers than fewer days per worked per week (Hamermesh, 1996).

In the US, legislation has just passed that funds the 24 US states that already include STC as part of their state’s unemployment insurance program to expand them and incentivize other states to adopt work sharing STC programs. The motivation behind the two bills would be that additional, federal funding would spread the use of work sharing STC and save even more jobs and also save states’ unemployment insurance trust funds from being drained or having to borrow. In addition, a proposed new tax credit would allow employers to reduce employee work time, while still maintaining their pay. One attractive feature of expanding STC programs is that it would dovetail with some of the pending policy proposals in the US that also involve work hours reductions. This includes proposals for paid leave, in the form of paid sick leave and parental leave time (for Federal employees). The most comprehensive and relevant proposal regarding weekly hours of work is the “Working Families Flexibility Act” (H.R. 1274). The latter would authorize an employee to request from an employer a change in the terms or conditions of the employee’s employment if the request relates to: (1) the number of hours the employee is required to work; (2) the times when the employee is required to work; or (3) where the employee is required to work. Policies that promote a more flexible workplace by better matching working hours with those preferred by employees can not only reduce overemployment, but also achieve job preservation, particularly in firms that are contracting. Moreover, reduced hours are bound to also serve environmental sustainability (Lajeunesse, 2009; Rosnick and Weisbrot, 2006), and are likely to promote the longer-term sustainability of working humans as well. Thus, work-sharing and STC could be a key subset of any potentially broader effort to to more formally and permanently institutionalize reductions in working hours, in whatever form. They are currently not sufficiently on the menu of options for employers, employees and policy makers, which has the unrealized potential to improve both the quantity and quality of employment opportunities. Policy innovations such as the recent Middle Class Tax Relief and Job Creation Act of 2012, which allocated funds for existing and new states to adopt and implement STC in the UI systems, are important first steps toward this ultimate goal.

3 The particular industries where work-sharing might be welcomed by the typical worker employed there, to the extent this indicates a relatively stronger than average desire for reduced work hours. These industries are: Paper and related Manufacturing, Transportation, Communications, Utilities & Sanitary Services, Wholesale Trade, Hospitals and Medical Services other than Hospitals (Golden and Gebreselassie, 2007).
In sum, this chapter has demonstrated the potential power of institutionalizing work-sharing, whether temporary or permanent, to protect employment levels in recession or perhaps feed employment growth during recoveries. From the empirical analyses and simulations generated herein, using a four equation VAR model, variance decompositions and impulse response functions, we may conclude, from the US case, that during economic downturns and slumps, a “realistic case” scenario is that some additional employment can be gained, if a reduction in the length of the weekly work hours can be induced in conjunction with declines in output, in the durables goods manufacturing sector, not the nondurables sector, although the former is where employers in North America have taken up any work sharing measures, however slightly. It cannot be discerned from the data what form of reduction—a shorter workweek, more opportunities for quality part-time work, limits on overtime or types of reduced annual work hours, would deliver this. It may be generalized from the results that it matters little what form such weekly hours reductions take, just that they be accompanied by partial, rather than either no or full wage replacement. However, the employment effects appear to be achievable virtually exclusively. What is clearly more important is that any reduction be accompanied by partial restoration of earnings so as to prevent reinforcing a macroeconomic contraction, while also not raising the cost per employee during subsequent expansionary stages. Slight gains in employment seem possible with reduced hours during expansions, but in the nondurables, not the durables sector of manufacturing. Given the evidence that there is some potential substitutability of employment for hours, caution is warranted because the complementarity between hours and employment is strong. Thus, a crucial component for ensuring that work sharing preserves jobs is some sort of provision of partial income replacement, such as STC, to prevent macroeconomic repercussions of underemployment. The greatest gain to well-being for workers, thus, would occur if work sharing measures were targeted toward the sectors where employment gains are most realizable, and also where hours reduction were mainly preference-based, in the industries where involuntarily long work hours are highest. Even if not entirely preference-based, however, institutionalizing built-in stabilizers to absorb a downturn, more formally in place, before a “crisis” starts rather than installed during or after it. The results suggest they would appear to be a powerful tool to lessen the severity of employment reductions during recessions and thus ought to appear on the menu of coping options particularly in countries currently lacking formal programs that promote adjustment through hours reductions.

REFERENCES


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